FLAT CAT

FLYING

MODEL ROCKET KIT

FINISHED MODEL LENGTH 19 IN. WT. 1 OZ.

MACH 10 SERIES

BALSA PARTS

WITH FIBER-TUBE ROCKET BODY

FLYING ROCKET BOOST GLIDER

Lift off! And the 16" glider and rocket pod soar! At apogee the glider disengages and flies through the sky, circling the launch area, while the pod returns by a safe streamer recovery.

Engines and Launcher Not included in kit.
USE *ONLY* THE FOLLOWING MPC ROCKET ENGINES WITH THE FLAT CAT
A3–2 B3–3

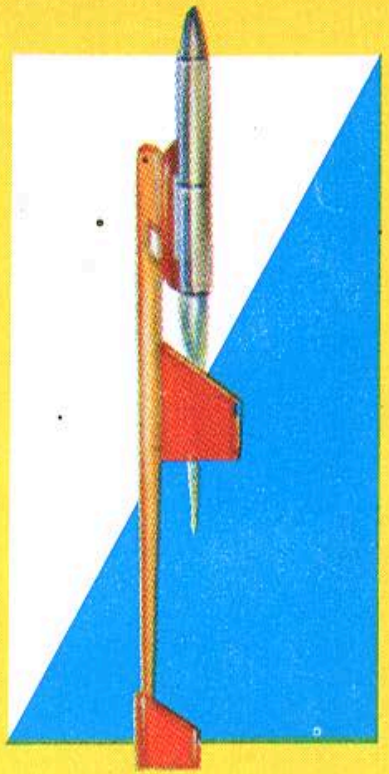
MPC

FLAT CAT

FLYING

MODEL ROCKET KIT

R-216



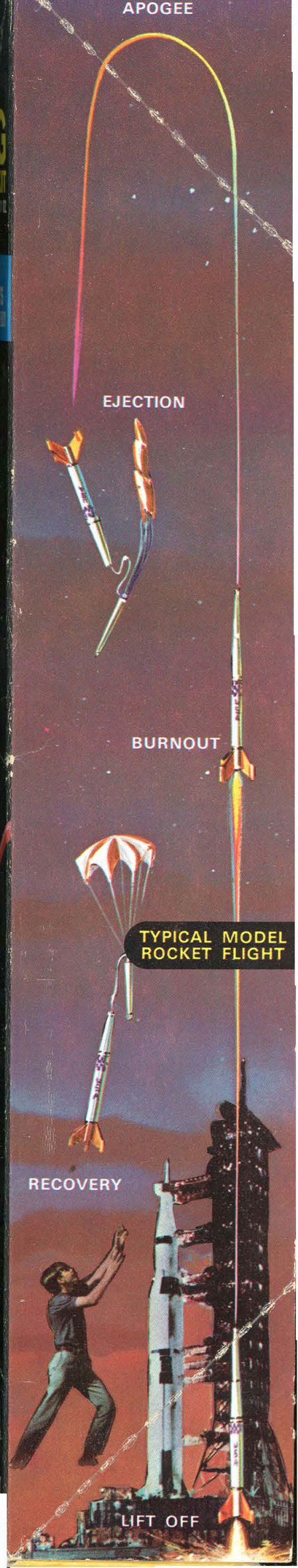
HIGH-FLYING WINGED CRAFT —STREAMER RECOVERY FOR LAUNCH POD—MAGNIFICENT SOARING GLIDER

Successful model rocketry is totally dependent upon the constant observation of safety regulations. MPC urges all rocketeers to know and abide by The National Association of Rocketry's model rocket safety code.

Paint to match illustrations available at your dealer. Cement not included.

Made & Litho in U.S.A.

MODEL PRODUCTS CORPORATION


APOGEE
EJECTION
BURNOUT
TYPICAL MODEL ROCKET FLIGHT
RECOVERY
LIFT OFF

Model Rocket SAFETY CODE

I am a model rocketeer and do not engage in any other form of non-professional rocketry. As a member of the NATIONAL ASSOCIATION OF ROCKETRY, it is my responsibility to keep model rocketry safe. Because safety is my watchword, I will obey this NAR Model Rocket Safety Code:

1. I will use only pre-loaded, factory-made commercial model-rocket engines that do not require my mixing of chemicals.
2. I will make model rockets of paper, wood, plastic, and other non-metallic materials.
3. I will always use a recovery device in my model rockets that will return them safely to the ground so that they may be flown again.
4. My model rockets will weigh less than 16 ounces and will contain less than 4 ounces of propellants in their engines.
5. My model rockets will contain no explosive warheads.
6. I will fly model rockets in open areas away from buildings and power lines.
7. I will check the stability of my model rockets before flying them so that their flight paths will be predictable.
8. I will use a remotely-operated electrical firing system to ignite and launch my model rockets.
9. I will use a launching device that is pointed within 30 degrees of the vertical.
10. My model rockets will not be flown as weapons against targets.
11. I will fly model rockets in good weather conditions only.
12. I know that model rockets share the air with other objects and must present no hazard to such objects.

The Safety Code of the
National Association of Rocketry

MODEL PRODUCTS
126 GROESBECK HIGHWAY
MOUNT CLEMENS, MICHIGAN 48043

FLAT CAT

The "FlatCat" was specifically designed by G. Harry Stine as a boost-glider that could be easily and quickly built by beginners while at the same time being suitable for competition and improved performance with only minor modifications. It can also be used as a "test bed" for checking various boost-glider design theories because it is possible to modify it extensively from the proven basic design.

Since its introduction in the YMCA Space Pioneers Section of the NAR in 1967, FlatCat has undergone only minor changes to improve its flight characteristics and to make it easier to build and fly. Three years of research preceeded its original design. It has been flown successfully, by hundreds of model rocketeers, both young and old, with varying amounts of experience. It will accept both Type A3-2 and Type B3-3 motors. It has been flown in national competition and has won numerous ribbons and trophies.

Read and follow instructions carefully

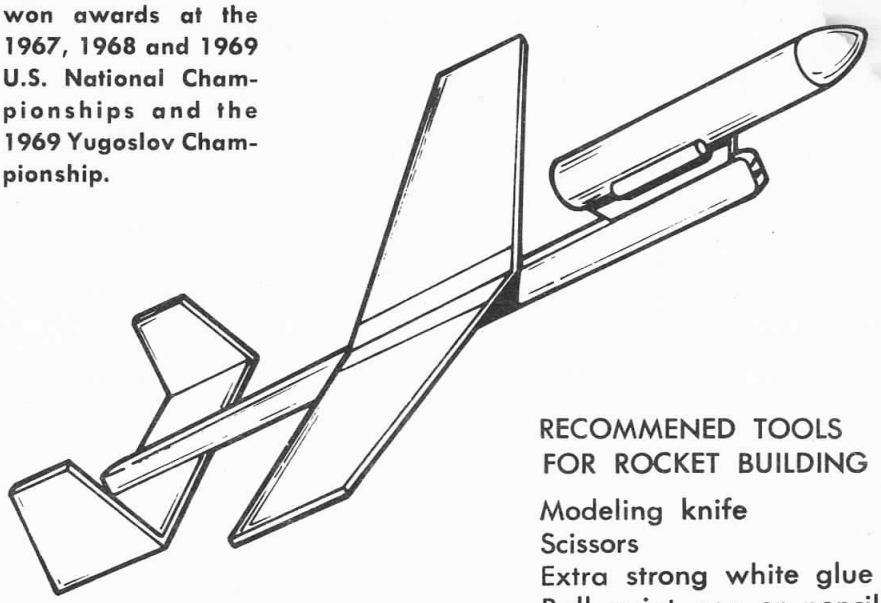
Before you begin building, look over the instructions carefully. Following the procedure given, test fit parts together without gluing. This way you will be more familiar with the location of parts when it becomes time to use glue. You should have no trouble assembling your kit if the instructions are followed properly. The parts list will acquaint you with the pieces in the kit.

DOUBLE GLUE JOINTS: To make a glue joint that is stronger than the balsawood, make a "Double Glue Joint" with white glue or model airplane glue (NOT glue for plastic models):

1. Apply glue to BOTH surfaces to be joined.
2. Let it dry.
3. AGAIN, apply glue to BOTH surfaces.
4. Join them together.
5. Let it dry.

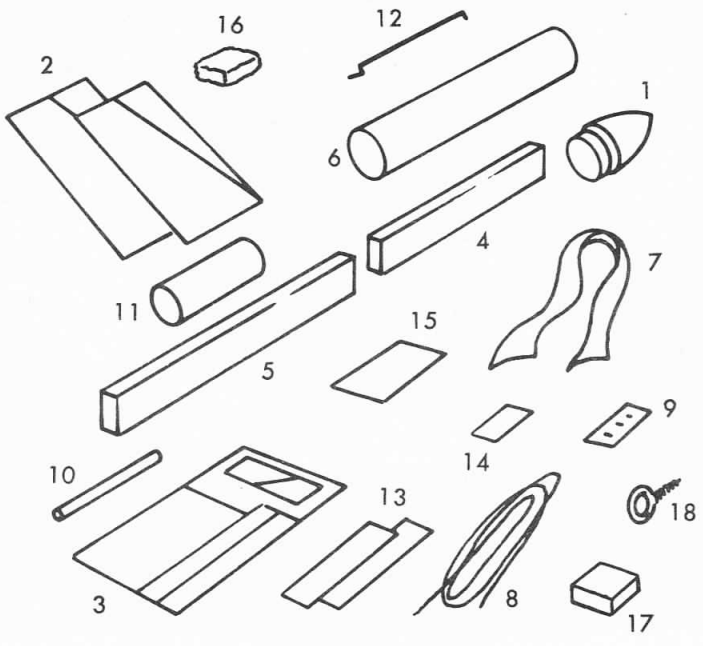
FlatCat is an international favorite. It has won awards at the 1967, 1968 and 1969 U.S. National Championships and the 1969 Yugoslov Championship.

RECOMMENDED ENGINES A3-2, B3-3



RECOMMENED TOOLS FOR ROCKET BUILDING

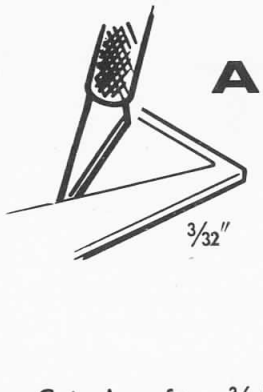
Modeling knife
Scissors
Extra strong white glue
Ball point pen or pencil
Fine grit sandpaper

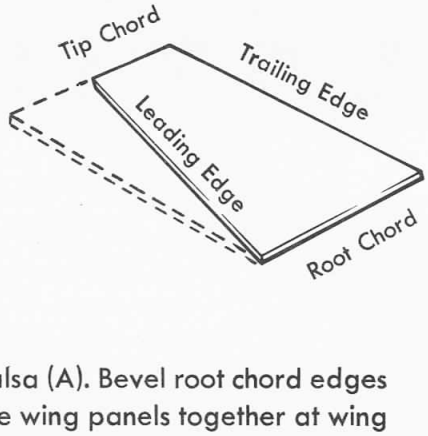


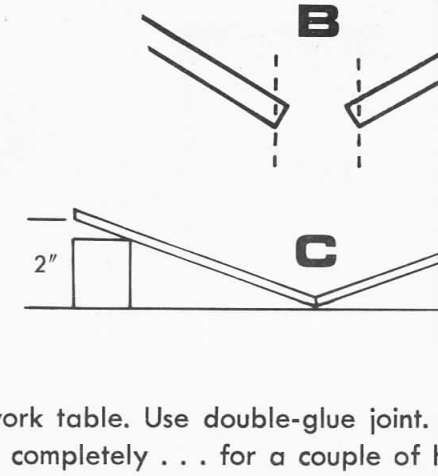
PARTS LIST

1. NOSE CONE
2. WING SHEETS 3/32 x 3 x 7
3. TAIL SECTION SHEET 1/16 x 3 x 8
4. BODY STOCK 1/4 x 1/2 x 8
5. BODY STICK 1/4 x 1/2 x 12
6. BODY TUBE 20 MM x 6
7. STREAMER
8. SHOCK CORD
9. SHOCK MOUNT
10. LAUNCH LUG
11. ENGINE COMPARTMENT
12. ENGINE CLIP
13. MYLAR TAPE
14. ADDRESS LABEL
15. COUNT DOWN CARD
16. WADDING
17. TRIM WEIGHT (CLAY)
18. SCREW EYE

1







Cut wings from 3/32" sheet balsa (A). Bevel root chord edges with sandpaper (B) and glue wing panels together at wing root with each tip elevated 2" to give wing dihedral (C). Set wing on waxed paper to do this so that wing does not get glued to work table. Use double-glue joint. thoroughly and completely . . . for a couple of h over night.

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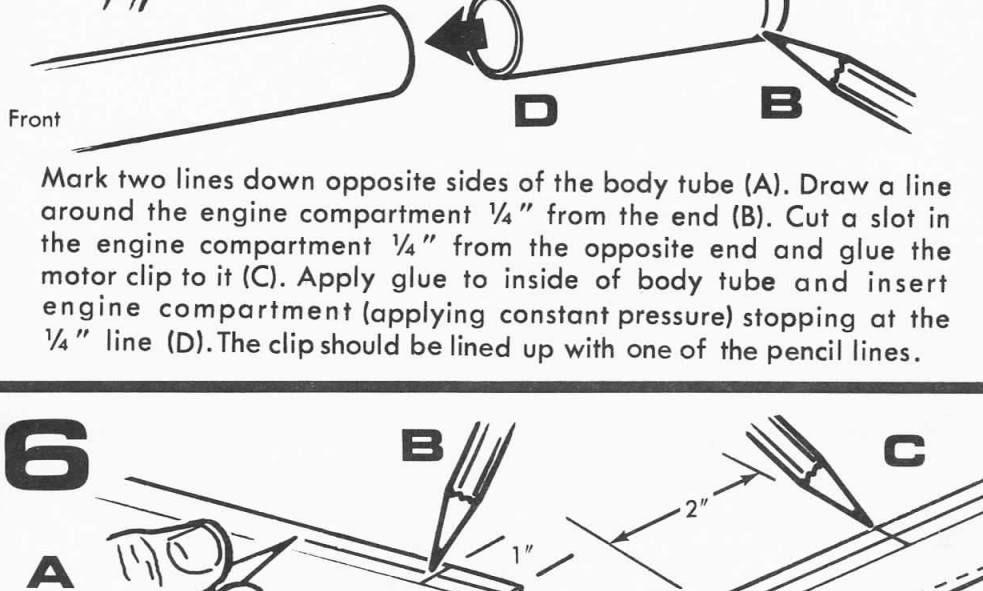
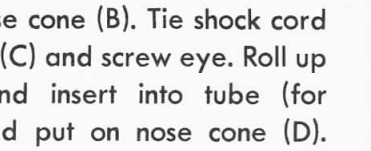


Mark two lines down opposite sides of the body tube (A). Draw a line around the engine compartment 1/4" from the end (B). Cut a slot in the engine compartment 1/4" from the opposite end and glue the motor clip to it (C). Apply glue to inside of body tube and insert engine compartment (applying constant pressure) stopping at the 1/4" line (D). The clip should be lined up with one of the pencil lines.

4



Lace shock cord through shock mount (A) and glue assembly inside body tube 1 inch from the end. Glue screw eye into nose cone (B). Tie shock cord to streamer (C) and screw eye. Roll up streamer and insert into tube (for storage) and put on nose cone (D).

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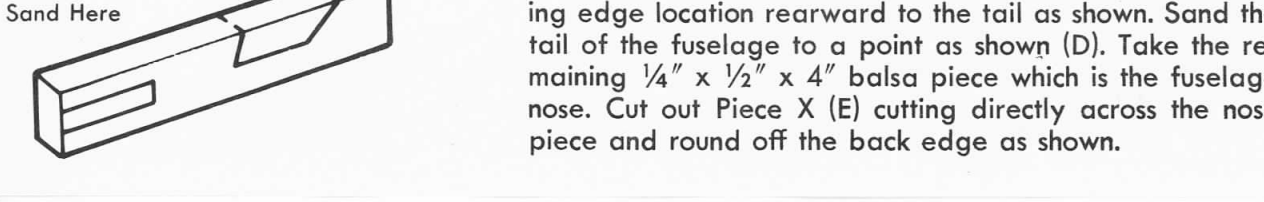

Take the 1/4" x 1/2" x 12" fuselage piece and mark a center line down both 1/4"-wide faces of this balsa piece using the pencil (A). Mark the location of the wing 1" back from the front of this fuselage piece (B). Mark the location of the stab on the OTHER END and on the OPPOSITE 1/4" face of the piece (C). Taper the fuselage piece from the wing trailing edge location rearward to the tail as shown. Sand the tail of the fuselage to a point as shown (D). Take the remaining 1/4" x 1/2" x 4" balsa piece which is the fuselage nose. Cut out Piece X (E) cutting directly across the nose piece and round off the back edge as shown.

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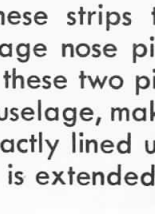

Using a double
Piece X as show
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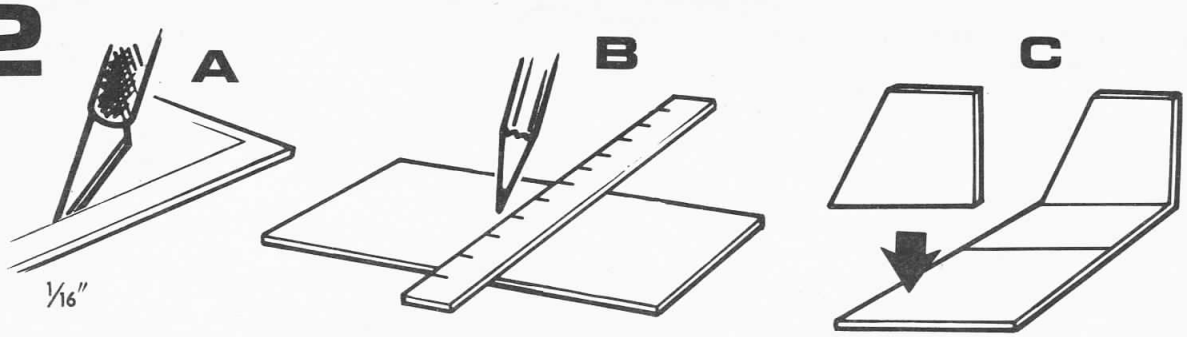
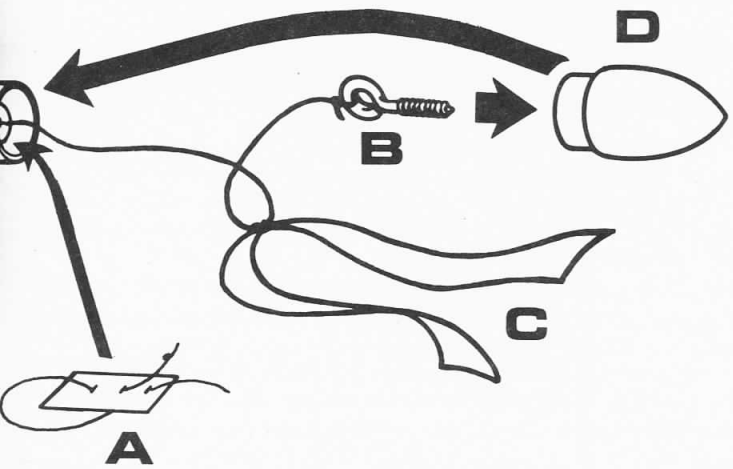


Cut stab and rudders from the 1/16" sheet balsa (A). Mark center line on both sides of the stab (B). Glue rudders ON TOP of the tips of the stab (C), making sure that the stab tips are cut square and that the rudders are lined up and standing up at right angles to the stab.



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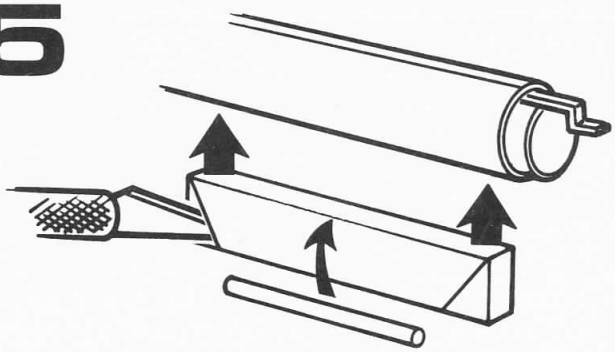
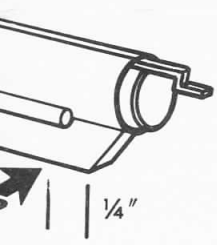
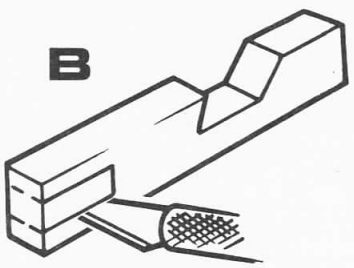
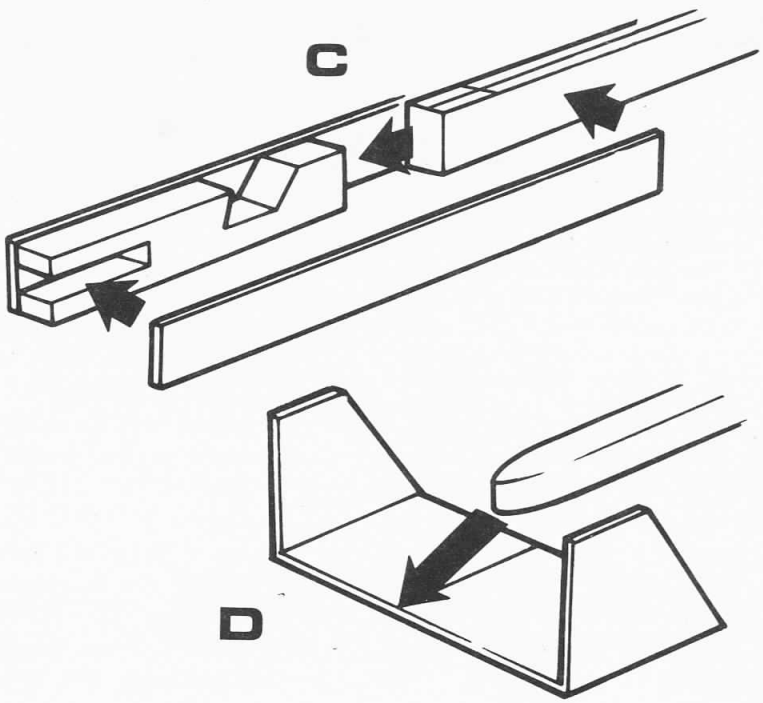


Make the Power Pod Pylon from one piece of 1/4" x 1/2" x 8" balsa. Cut in half on line. Cut both ends to 45-degrees as shown. Glue pylon to the body tube on the opposite side from the motor clip, making sure that the pylon is precisely in line with the pencil line. Glue the launching lug on the side of the pylon as shown, making sure that no glue gets inside the launching lug.

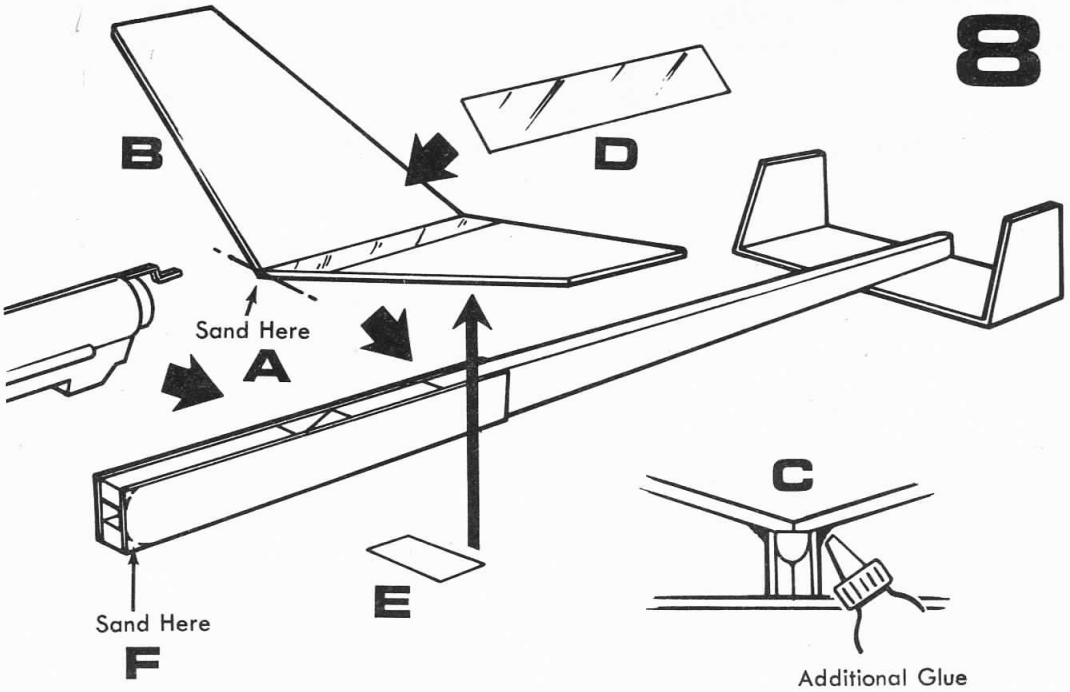






glue joint cement (A). Cut the fuselage nose piece so that it will later pace for a trim side pieces from 1/2 x 6), glue one the side of the ce. Then carefully ces to the front of ng sure everything , so that the fuse- by the addition of these pieces. When everything is lined up, glue the remaining 1/2" x 6" nose side piece to the opposite side of the nose (C). Using a double-glue joint, attach the stab-and-rudders tail assembly to the BOTTOM of the fuselage tail (D). Make sure that the center line drawn on the stab is precisely lined up and matching with the center line drawn down the fuselage. If the tail section is not lined up carefully, the FlatCat will have a permanent turn built into it.

MOST IMPORTANT STEP: Sand a flat portion on the bottom of the wing root joint so that the wings will fit flat to the fuselage top and so there is plenty of glue area (A). Attach the wings to the top of the fuselage (B). Make a GOOD glue joint. If you don't, the wings won't stay on in flight. Make sure the wings are carefully lined up. The line of the wing root dihedral joint should line up with the center line drawn along the fuselage. When you look at the model from the front or rear, both wings should have the same dihedral angle with the fuselage as shown in the rear-view drawing of the model. When the glue joint has set, add additional glue in a layer at the wing-fuselage joint (C). Peel the paper backing from the aluminized mylar tape and apply the tape to the top of the wing over the root where it joins the fuselage (D). This will prevent the balsa of the wing from becoming scorched by the jet exhaust. Apply address label (E). When everything is DRY, sand the nose of the fuselage round as shown (F). Your FlatCat is now ready for pre-flight balancing.



BALANCING (TRIMMING)

BALANCING (TRIMMING): You *must* do this. Otherwise, your FlatCat may not fly. Since FlatCat must operate as a rocket during ascent and as a glider during descent, it's very important to have the model balanced properly for both boost and glide phases of the flight.

1. Glide Trim: With the pod *off,* hand-launch the glider by grasping it under the wings and tossing it gently with an overhand motion into a flight path just slightly below horizontal. Do this several times because there is a knack to it that sometimes does not come easily. If the model pulls up into a stall, add weight to the nose with trim weight (clay) in the hollow portion. If the model dives into the ground consistently, add trim weight to the tip of the fuselage tail. If the glider turns left or right, add a bit of trim weight to the high wing tip, the wing tip that is on the outside of the turn. When you have the FlatCat trimmed for glide, it should sail away from your hand in a gentle glide, perhaps stalling just slightly, and turning slightly to the right. If you do not set the FlatCat for a gentle turn, it may turn downwind in actual flight.

2. Boost Trim: With a Type A3-2 motor installed in the power pod, check for balance or trim during boost flight. The model should balance NO FURTHER AFT than the leading edge at the wing root (the wing-fuselage joint). If it balances further aft than this point, add a trim weight to the base of the power pod nose cone, and NOT to the glider portion. Remember, your glider is already trimmed for glide, so any weight changes for boost flight should be made to the pod which separates before glide can begin. If the balance point is further forward than the point indicated, you should have no trouble with the FlatCat during boost flight.

FLYING FLATCAT

FlatCat must be launched from an MPC Lunar Lectric Launch System or simular model rocket launch complex.

Make certain that the power pod fits LOOSELY onto the fuselage with Piece X fitting into the hole from which it was cut. The power pod can be extremely loose and the model will still perform correctly during boost; this is because the model rocket motor in the power pod pulls the glider into the air. If the power pod fits too tightly sand down the SIDES and BACK of Piece X until the power pod fits loosely.

The mechanism that causes the power pod to separate from the glider is the reaction force created by the sudden ejection of the wadding, streamer and nose cone by the motor ejection charge. This reaction force thrusts the power pod to the rear, disengaging Piece X from its slot in the fuselage. The motor holder wire prevents the model rocket motor from being ejected when this occurs because a large reaction force is required.

It is therefore necessary to pack the wadding rather tightly into the power pod when preparing the model for flight.

If the pod does not come off, or if the glider entangles itself with the streamer—causing a "Red Baron" spiral—it means that you have not packed the wadding tightly enough.

Insert motor into power pod so the engine clip holds it into the tube. Insert wadding into front of tube and pack down tightly with pencil. Roll up streamer and wrap shock cord around it. Insert streamer into tube, then put on nose cone. Mount power pod on glider as discussed above. Put FlatCat on Lunar Lectric Launcher and follow procedure listed on MPC Count Down Card.

The FlatCat is strong enough to survive most dives due to improper trim. It has been designed this way because a glider of this particular configuration without airfoiled wings is often very tricky to trim for glide. In addition, the glider may also be airspeed-sensitive so that if the power pod separates while the model is in a dive, the glider will continue in the dive.

If you have rounded off and streamlined your glider, the FlatCat becomes a Round Hound! ! !

For a good flight, each and every time, use an MPC LUNAR LECTRIC LAUNCH PAD, and LAUNCH CONTROL to fly your model rocket.

In the event that engines are not available in your area, take advantage of our three engine package by sending $1.25 to MODEL PRODUCTS CORP., 126 Groesbeck, Mt. Clemens, Michigan 48043.

If under 13 years of age, your order must be accompanied with a note from parent or guardian.

MODEL PRODUCTS

COUNT DOWN CARD

T minus 15—PRE-FLIGHT SAFETY CHECK: Engine installed tightly; nose cone and recovery system GO; fins straight and undamaged.
T minus 14—FIRING SYSTEM SAFETY KEY IN HAND!
T minus 13—Load Launcher. Model slides freely on launch rail.
T minus 12—Clean firing systems clips. Hook up ignitor.
T minus 11—Adjust launcher tilt for wind.
T minus 10—Clear launching area.
T minus 9 — RANGE SAFETY CHECK: Launch area clear. No aircraft overhead.
T minus 8 — KEY IN. Panel armed.
T minus 7 — CONTINUITY LIGHT ON
T minus 6 — IGNITION SEQUENCE START.
T minus 5 — AND COUNTING
T minus 4 — AND COUNTING
T minus 3 — AND COUNTING
T minus 2 — AND COUNTING
T minus 1 — IGNITION ON
T minus 0 — ENGINE IGNITION — LIFT OFF.

MISFIRE PROCEDURE: Release firing switch. Remove safety key. Wait one minute. Approach launcher carefully. Keep hands and fingers from under model. Keep head, body and hands to side of model. Initiate misfire cause tests.